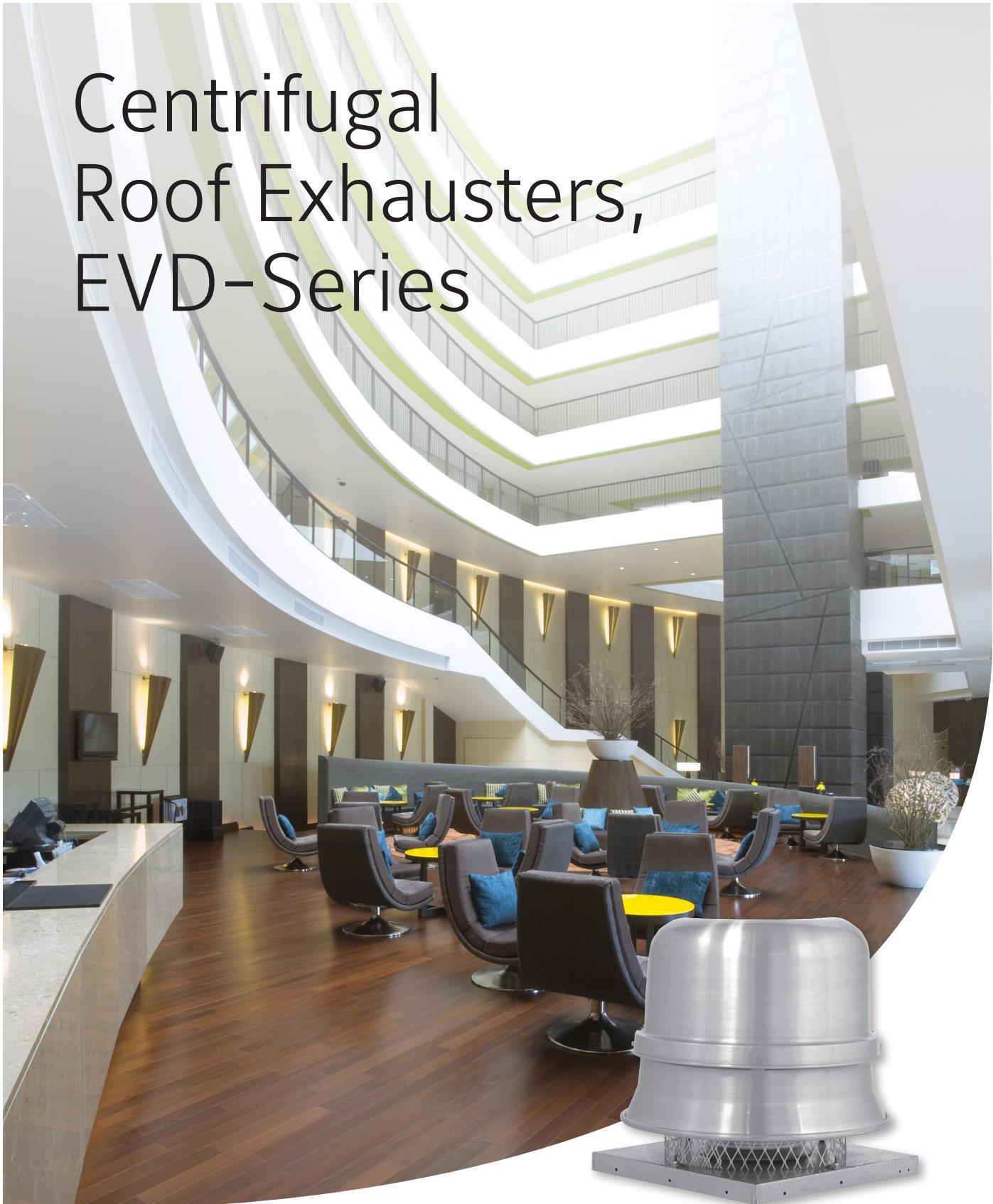


# Centrifugal Roof Exhausters, EVD-Series



 **YORK®**

BY JOHNSON CONTROLS

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BY JOHNSON CONTROLS

*Belt Drive  
EVD**Direct Drive  
EVD*

## INTRODUCTION

### Downblast Roof Exhauster

The EVD-Series of fans are ideal for general purpose exhaust applications including: bathrooms, garages, general kitchen areas, offices, churches, dormitories, factories, large warehouses and other relatively clean air applications.

They feature a weather-resistant, seamless spun aluminum housing which works in conjunction with a patented wheel design and deeply spun inlets to provide smooth quiet air flow through the ventilator. The centrifugal wheels are aluminum, nonoverloading, backward inclined, robotically welded, and dynamically balanced. The optional high wind construction makes the EVD-Series of fans particularly suited for high wind hurricane zones.

### Direct Drive Units

#### Model: EVD (V/S/R/Q/Q1/Q2)

- Static pressure up to 1.25" wg.
- Flow capacity up to 4,561 CFM.
- High wind construction (-HW) option available.

### Standard Duty Belt Drive Units

#### Model: EVD (B)

- Static pressure up to 1.5" wg.
- Flow capacity up to 19,442 CFM
- High wind construction (-HW) option available.

### High Capacity Belt Drive Units

#### Model: EVDK, EVDJ, EVDM

- Static pressure up to 1.5" wg.
- Flow capacity up to 39,169 CFM

## CERTIFICATIONS & LISTINGS

### AMCA Certification

YORK® by Johnson Controls certifies that the EVD-Series of models shown herein are licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA publication 211 and AMCA publication 311 and comply with the requirements of the AMCA Certified Ratings Program.



YORK® by Johnson Controls certifies that the EVD-Series of high capacity models shown on pages 25 - 27 are licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA publication 211 and comply with the requirements of the AMCA Certified Ratings Program.



### UL and cUL Certification

EVD-Series fans carry the UL label, UL705 (ZACT/ZACT7), file #E28413.

### High Velocity Hurricane Zone (HVHZ)

Miami-Dade NOA # 14-0311.03

Florida Product Approval #12339

Texas Department of Insurance #RV-48

## FEATURES & BENEFITS

### Motor Selection

Both direct drive and belt drive models are available with a wide range of voltages and enclosures (see Motor Selection for a complete listing). Standard belt drive Open Drip Proof (ODP) ball bearing motors are selected using a conservative portion of the NEMA service factor. Standard direct drive ODP motors have Class B insulation and internal thermal overload protection. Each size is carefully engineered to match the motor to the wheel capacity.

### Internal Wiring

All direct drive models with ODP motors feature a polarized disconnect plug between the motor and junction box. This provides a positive method of electric shut-off. Belt drive units with ODP motors are factory-wired between the motor and junction box. For either direct drive or belt drive models, an electric disconnect is available.

### Sound Performance

Units deliver outstanding air performance with minimal noise.

### Curb Caps (Base)

Curb caps for direct drive and standard duty belt drive models are available in galvanized steel (standard) or aluminum (optional). Curb caps for high capacity belt drive models are available only in aluminum. All curb caps have fully welded corners and are pre-punched to ensure both a leak-tight and easy installation.

### Forced Motor Cooling

Breather slots between the motor dome and discharge apron enable fresh air to be drawn into the motor housing during fan operation. This positive cooling promotes longer life for motor and drive components.

### Easy Maintenance Access

By removing the fasteners, the motor dome lifts off for complete access to all the drive train components.

### Structural Integrity

Durable housings of spun aluminum have a high strength-to-weight ratio and incorporate a rolled bead for additional strength. There are no welds to break or seams to leak. The heavy-gauge motor mounting platform provides positive rigidity between all components of the power train assembly.

### Solid Steel Shafts

Sized so the first critical speed is a minimum of 200% of maximum cataloged operating speed, shafts are precision ground and polished.

### Internal Bracing

Tri-Strut™ supports transfer the weight of the motor mounting platform directly to the curb mounting surface. The aluminum spun housing, therefore, is not used to support any weight.

### Self-Aligning Bearings

Heavy-duty bearings are sized for a minimum L50 life in excess of 200,000 hours of operation. 100% factory tested, they are designed for air handling applications.

### Drives and Belts

Pulleys are pre-set to the specified RPM. Cast iron variable pitch pulleys are adjustable, allowing for field balancing based on actual field conditions. All pulleys are sized for at least 150% of the driven horsepower.

### Vibration Isolators

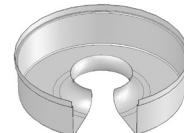
Multidirectional, rubber-in-shear vibration isolators are used to mitigate residual vibration transmission from the motor and bearing support to the building.

### Conduit

Both direct and belt drive units include a large 1" nominal conduit chase for easy installation of wiring from the motor dome to below the curb cap.

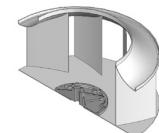
### Reverse Venturi

Reverse venturi reduces turbulence and improves distribution of the air as it enters the wheel inlet and is "captured" by the blades.



### Aluminum Wheels

EVD fans offer patented wheel designs. Carefully matched highly-tooled venturis enhance the performance of these backward inclined and non-overloading centrifugal wheels. Made of advanced alloys, the various wheel components provide superior strength and durability.



### Silent Wheel (Direct Drive)

- Blades' highly curved leading edge provide unsurpassed low sound numbers with excellent air performance.
- Back plate and inlet are stamped for consistency, plus dynamic balancing assure smooth, vibration-free operation.
- Riveted and/or welded construction ensure superior dependability over other wheel designs.

### Standard Duty, All Welded Wheel

(Standard Duty Belt Drive)

- Blades are curved for improved air performance while increasing their strength and rigidity.
- Back plate and inlet are punched for consistency. They include a perimeter rim which enhances strength and improves balancing.
- Wheel assembly is robotically welded to provide extremely durable and consistent performance.
- Wheel is dynamically balanced. Balancing weights are mechanically attached to the inside of the rims of both the back plate and wheel inlet. This allows a precise placement of the weights anywhere within a full 360° range on two separate planes, without the possibility of detachment.

## OPTIONS & ACCESSORIES

### Finishes

Coatings such as Polyester Powder Coat, Epoxy Powder Coat, Phenolic Epoxy Powder Coat, and others are available. See the coatings brochure for details.

### Mounting Pedestal

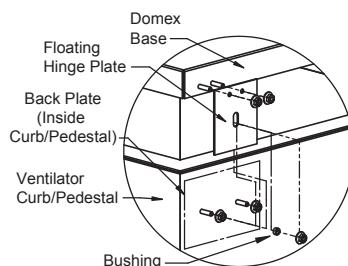
The 12" high mounting pedestal, available in aluminum or galvanized steel, incorporates a removable access panel for easy inspection and service of motor operated backdraft dampers. It provides solid ventilator support and a weather resistant seal that does not injure or disturb flashing.

### Hinged Sub-Base

Hinged sub-bases provide access to the curb well for damper service or cleanout. Constructed with a rustproof hinge arrangement and low height (3 1/2") the assembly is easily manipulated and reduces the impact on overall installation height. This accessory is available for use with most all models for either factory built or existing roof curbs.

### Floating Hinge Kit

A floating hinge kit is available for field installation. This assembly connects the exhauster directly to the roof curb and provides the same level of access as the hinged sub-base.



### Aluminum Bird and Insect Screen

Bird screens are available for all direct and belt drive models. An aluminum insect screen with a smaller mesh than the standard bird screen is also available.

### Backdraft Dampers

Backdraft dampers are available for either gravity or motorized operation (motor kit optional). Dampers feature square galvanized steel frame, multi-leaf, roll formed aluminum blades with nylon bearings.

### Safety Disconnect Switch

Safety disconnect switches are available to allow positive electrical shut-off and safety. NEMA 1 switches are factory mounted when factory wiring is requested, others will be shipped loose. Wiring is only run from the motor to the junction box. (Factory wiring of explosion proof applications is not available.) A wide range of NEMA rated enclosures with disconnect switches are available for indoor, outdoor, and explosion proof installations. Disconnects are to be field wired by a licensed electrician.



### Firestat Switch

Firestat switch automatically disconnects the unit when the temperature of the air being exhausted exceeds a preset rating.



### Time-Delay Switch

(Selected direct drive models only.) The Airminder Model AM12 switch is a UL recognized and CSA certified time-delay relay that operates both the fan and room light to ventilate an area even after the occupants depart. In the "On" position, the Airminder turns the light and fan on immediately. In the "Off" position, the light goes off immediately and the fan is in operation for a period of time as preset from 1 to 60 minutes. Suitable only for 1/3 HP maximum at 120/1/60.



### Speed Controllers

The Lektrol™ controller allows adjustment in speed to a maximum of 50% reduction, which results in a very cost effective means for system balancing. The device can be located under the fan dome to prevent unauthorized tampering or on the wall for ease of operation by the building occupants. (Available on direct drive units with ODP motors and some select TE motors. See reference table under Motor Availability)

### Automatic Belt Tensioner

The factory mounted Automatic Belt Tensioner accessory eliminates the need for re-tensioning the belt after start-up. It is constructed from 10 gage galvanized steel and incorporates five torsion springs to automatically position the motor and maintain proper belt tension. Additional benefits include reduced belt and pulley wear and simplified belt replacement without tools. The Automatic Belt Tensioner is available for EVD models EVD11B, EVD12B, and EVD14B with 1/4, 1/2, 3/4 and 1 HP ODP motors. It can also be used with 1.5 HP, 3-phase ODP motors.



### Internal Wiring

NEMA 3R wiring is available for both direct and belt drive models.

### Spark Resistant Construction

AMCA 'B' construction is available on belt drive and is optional on direct drive units with a special quote. If required, an explosion proof motor and disconnect may be selected as options.

### Prefabricated Curb

A variety of sizes of prefabricated roof curbs are available. Galvanized steel unibeam curbs are the most popular. For a complete listing of all curb types and sizes available, please consult the Roof Curb brochure.

## OPTIONS & ACCESSORIES

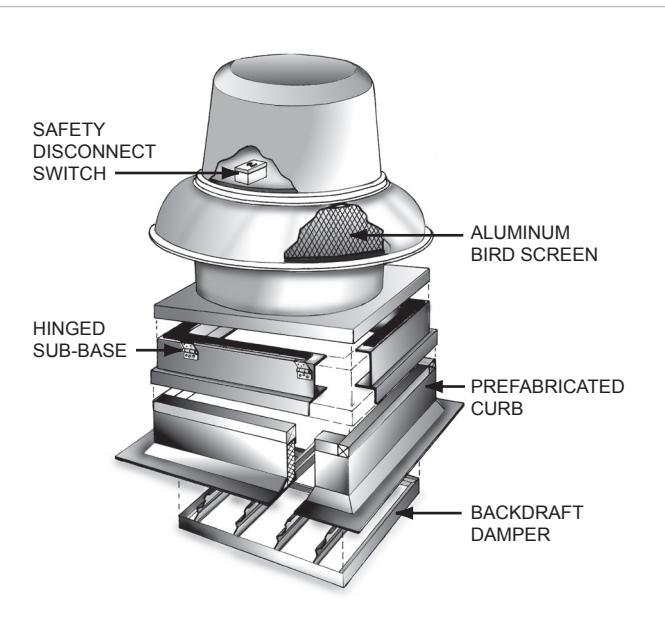
### High Wind Construction

High wind construction units are specifically designed for high velocity hurricane zones (HVHZ). They are designed to withstand 150 MPH winds in accordance with Miami-Dade and Florida Building Code standards. The units are tested and certified through a 3rd party Professional Engineer (P.E.) to meet these strict standards. Installation details are provided and since there are no tie downs or external braces required for attaching the unit to the roof or curb this makes installation simple and easy. A wide range is offered to meet all of your ventilation needs which includes all belt and direct drive sizes 36 and under.

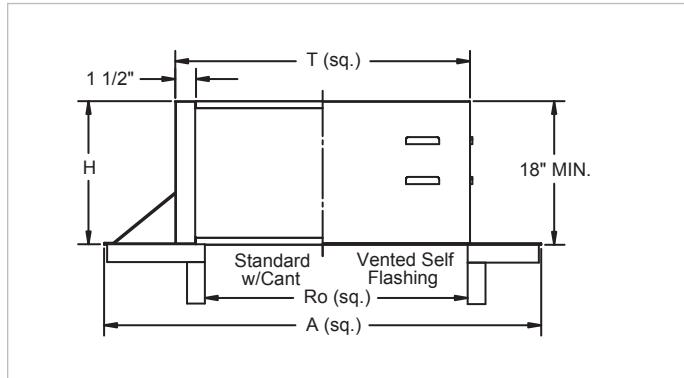
### Product Certifications:

- Miami-Dade NOA # 14-0311.03
- Florida Product Approval #12339
- Texas Department of Insurance #RV-48

### EVD Exploded View



### EVD Curb Dimensions



All dimensions in inches.

(1) Standard heights "H" are 8", 12", and 18" including wood nailing.

(2)"T" dimension of curb is 1 1/2" less than the dimension of inside base of fan ("E").

(3)"Ro" refers to Roof Opening.

(4)"E" dimension is inside base of fan.

Model	E <sup>(4)</sup> SQ	T <sup>(2)</sup> SQ	A SQ	Ro <sup>(3)</sup> SQ	Damper Size SQ	Galv. Steel Gauge
EVD06R	18.5	17	25	9	8.75	18
EVD08S/R	18.5	17	25	9	8.75	18
EVD10S/R	18.5	17	25	11.5	11.25	18
EVD11V/S/R/Q	18.5	17	25	11.5	11.25	18
EVD13V/S/R/Q	18.5	17	25	11.5	11.25	18
EVD16V/S/R/Q1/Q2	20.5	19	27	16	15.75	18
EVD18V	28.5	27	35	20	19.75	18
EVD06B/EVD08B	18.5	17	25	11.5	11.25	18
EVD11B	20.5	19	27	16	15.75	18
EVD12B/EVD14B	24.75	23.25	31.25	16	15.75	18
EVD16B/EVD18B	28.5	27	35	20	19.75	18
EVD24B	33.5	32	40	25	24.75	18
EVD27B/EVD30B	36.5	35	43	28	27.75	18
EVD36B	44.5	43	51	36	35.5	18
EVDK420	52.5	51	59	44	43.5	18
EVDJ48	59	57.5	65.5	50	49.5	18
EVDM542	63.5	62	70	55	54.5	18

## MOTOR AVAILABILITY

### Fixed Speed Motor Control

Two-speed motors, used in conjunction with external switches or sensors (gas concentration, odor, temperature), are used to quickly adjust the airflow through the ventilator by changing from one fixed speed to another. Normally, 2-speed motors operate at 1800 and 1200 RPM (2-speed, 2-windings). However, 1800/900 RPM (2-speed, 1 winding) motors are available for 3-phase power only. A single operating voltage must be specified because dual-voltage versions are not available in a 2-speed motor.

### Variable Speed Motor Control

YORK® by Johnson Controls offers Lek-Trol™ solid state controllers to reduce the high speed of most direct drive motors by as much as 50%. If variable speed is required, check the Lek-Trol™ availability table below to verify that controllers exist for the fan model selected. Remember, Lek-Trol™ controllers are currently only available for direct drive motors including all standard Open Drip Proof (ODP) 60 Hz motors. Not all totally enclosed motors are currently available with variable speed control. Inverter rated motors suitable for use with variable frequency drives can be supplied for belt drive models. Contact your local representative for availability.

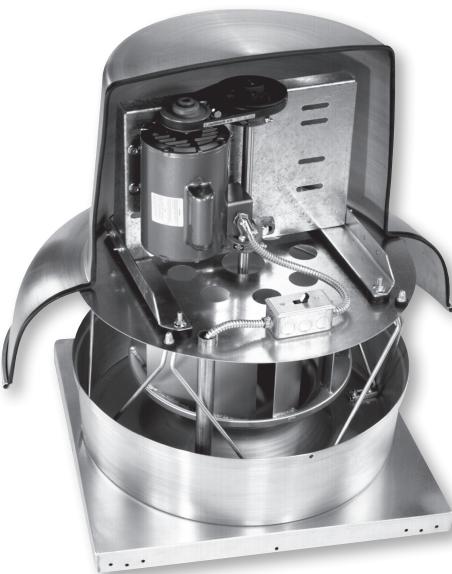
### Available Lek-Trol™ Speed Controls

Model	60 Hz					50 Hz		
	ODP	Totally Enclosed				Totally Enclosed		
		115V	115V	200V	208V	230V	110V	220V
EVD06R	LT25	-	-	-	-	-	-	-
EVD08S	-	-	-	-	-	-	-	-
EVD08R	LT25	-	-	-	-	-	-	-
EVD10S	-	-	-	-	-	-	-	-
EVD10R	LT30	LT30	LT35	LT35	LT35	LT30	LT35	LT35
EVD11V	-	-	-	-	-	-	-	-
EVD11S	-	-	-	-	-	-	-	-
EVD11R	LT30	-	-	-	-	-	-	-
EVD11Q	LT50	-	-	-	-	-	-	-
EVD13V	LT55	-	-	-	-	-	-	-
EVD13S	LT30	-	-	-	-	-	-	-
EVD13R	LT30	LT30	LT35	LT35	LT35	LT50	LT35	LT35
EVD13Q	LT45	LT50	LT35	LT35	LT35	LT50	LT35	LT35
EVD16V	LT55	-	-	-	-	-	-	-
EVD16S	LT50	-	-	-	-	-	-	-
EVD16R	LT50	-	-	-	-	-	-	-
EVD16Q1	LT40	-	-	-	-	-	-	-
EVD16Q2	LT75	-	-	-	-	-	-	-
EVD18V	LT60	-	-	-	-	-	-	-

*Direct Drive  
Cutaway*



*Belt Drive  
Cutaway*



## MOTOR AVAILABILITY

### Electronically Commutated Motors

EC motors provide significantly greater efficiency, flexibility, and controllability over standard direct drive permanent split capacitor (PSC) motors. Using the included potentiometer, these motors can be turned down to as low as 80% the max operating speed while maintaining 90% efficiency through the operating range. Additionally, they can accept 0-10V input to tie to building management systems, allowing for savings in not only direct fan energy consumption but reducing the exhaust of conditioned air during off peak hours as well. Motors come in open enclosure for usage with 115V-208V/230V, single phase, 50/60 Hz applications.

Model	Size	Tap	ECM HP
EVD	08	S	0.33
	08	R	0.33
	10	S	0.33
	10	R	0.33
	11	V	0.33
	11	S	0.33
	11	R	0.33
	11	Q	0.33
	13	V	0.33
	13	S	0.33
	13	R	0.33
	13	Q	0.33
	16	V	0.33
	16	S	0.50
	16	R	0.50
	16	Q1	0.50
	16	Q2	0.75
	18	V	0.75

### Belt Drive Motor Availability

The chart below lists horsepowers, voltages, and enclosure types. After selecting a model and horsepower that meets performance requirements, an engineer should verify that the desired voltage and enclosure are the same (or smaller) as the maximum NEMA motor frame shown for each model.

HP	1 Phase					200V, 230V, 460V or 575V 3 Phase				
	ODP		Totally Enclosed	Explosion Proof	2 Speed 2 Winding	ODP	Totally Enclosed	Explosion Proof	2 Speed 2 Winding	2 Speed 2 Winding
	115V	230V	115V/230V							
1/4	48	48	48	48/56	48	48	48	48	56	-
1/3	48/56	48/56	56	56	56	56	56	56	56	-
1/2	48/56	48/56	56	56	56	56	56	56	143T	56
3/4	56	56	56	56	56	56	56	56	143T	56
1	56	56	56	56	56	145T	145T	145T	143T	145T
1 1/2	56	56	145T	184T	-	145T	145T	145T	145T	182T
2	145T	145T	182T	182T	-	145T	145T	145T	145T	182T
3	184T	184T	184T	215T	-	145T	182T	182T	184T	184T
5	-	-	-	-	-	184T	184T	184T	184T	215T
7 1/2	-	-	-	-	-	213T	213T	213T	-	215T
10	-	-	-	-	-	215T	215T	215T	-	256T
15	-	-	-	-	-	254T	254T	254T	-	284T

On horsepowers less than 1 1/2, motor frame sizes may change due to variations in voltage, special features and motor manufacturer. Motors shown are ball bearing, continuous duty and 1750 RPM or 1750/1140 RPM for two speed - two winding motors.

## MOTOR AVAILABILITY

### Direct Drive Motor Availability

The following chart lists the various motor options available for each of the direct drive fan models. Once a fan model is selected, this chart can be used to determine if a suitable motor is available. (If not, another selection may have to be made from the fan performance charts). Look under the nominal RPM heading to determine which fans have 2-speed and 3-speed motors.

Model	Nominal RPM				1 Phase									
					115 Volts			200 - 240 Volts						
	1050 V	1300 S	1550 R	1725 Q	Open Drip Proof	Totally Enclosed	Explosion Proof	Open Drip Proof	Totally Enclosed	50 hz	50 C Ambient	Explosion Proof (4)		
EVD06R	-	-	x	-	yes	-	-	Use TE Motors	-	-	-	-		
EVD08S/R	-	x	x	-	yes	yes (1)	-		yes (1)	yes (1)	yes (1)	-		
EVD10S/R	-	x	x	-	yes	yes (1)	-		yes (1)	yes (1)	yes (1)	-		
EVD11V/S/R	x	x	x	-	yes	yes (1)	-		yes (1)	yes (1)	yes (1)	-		
EVD11Q	-	-	-	x	yes	yes	yes		yes	yes	-	yes (5)		
EVD13V/S/R	x	x	x	-	yes	yes (1)	-		yes (1)	yes (1)	-	-		
EVD13Q	-	-	-	x	yes	yes	yes		yes	yes	yes	yes (5)		
EVD16V/S/R	x	x	x	-	yes	yes (1)	-		yes (1)	yes (1)	yes (1)	-		
EVD16Q1	-	-	-	x (3)	yes	-	-		-	-	-	-		
EVD16Q2	-	-	-	x	yes	yes	yes		yes	yes	yes	yes (5)		
EVD18V	x	-	-	-	yes	-	-		-	-	-	-		

Model	Nominal RPM				3 Phase			
	1050 V		1300 S		1550 R		1725 Q	200 - 460 Volts (2)
								Explosion Proof (4)
EVD06R	-	-	-	-	x	-	-	-
EVD08S/R	-	-	x	-	x	-	-	-
EVD10S/R	-	-	x	-	x	-	-	-
EVD11V/S/R	x	-	x	-	x	-	-	-
EVD11Q	-	-	-	-	-	x	-	yes (6)
EVD13V/S/R	x	-	x	-	x	-	-	-
EVD13Q	-	-	-	-	-	x	-	yes (6)
EVD16V/S/R	x	-	x	-	x	-	-	-
EVD16Q1	-	-	-	-	-	x (3)	-	-
EVD16Q2	-	-	-	-	-	x	-	yes (6)
EVD18V	x	-	-	-	-	-	-	-

(1) High speed only.

(2) 200V - 240V, 380V, 415V, 460V.

(3) Nominal 1650 RPM.

(4) Cls.I, Grp.D, Div. I / Cls. II, Grp.F & G, Div.I., Not available with 50 Hz.

(5) 208V - 230V only. Not available in 200V.

(6) 230V and 460V only.

## EVD06, EVD08, EVD10, & EVD11 | DIRECT DRIVE

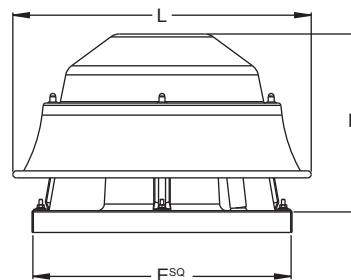
### Performance Data Overview

Direct drive models are available with single and multi-speed motors. Multi-speed motors are designated V (1050 RPM), S (1300 RPM), and R (1550 RPM). EVD06R and EVD18V are exceptions, being single speed motors. Q, Q1, Q2 (1725/1760 RPM) are single speed motors. A single EVD fan may be suitable for several requirements by a simple wiring change. This feature provides flexibility for a variety of reasons, including energy savings, off-hours requirements, future expansion, or unexpected field variations. Direct drive models are available in seven sizes (6, 8, 10, 11, 13, 16 and 18); capacities range from below 150 CFM to above 4500 CFM, with static pressures beyond 1 1/4".

By using Lek-Trol™ variable speed controllers, the high speed flow rate of most models can be reduced by as much as 50%. Do not use Lek-Trol™ on medium or low speed for multispeed models, unless a specific Lek-trol™ is shown to be available (see Lek-Trol™ Speed Controller Availability). When compared to belt drive models, direct drive fans require less maintenance, have a simpler construction, cost less, and are lighter in weight. Performances in 50 Hz applications will be less than shown below; consult with local representative.

Model	Material Gages			Dimensions				Est. Ship Wt.
	Alum. Base	Galv. Base	Hood/Apron	L (Dia.)	H	E*	Ro	
EVD06R	0.064"	16 ga.	0.050"	18 1/8	12 5/8	18 1/2 x 18 1/2	9 x 9	22 lbs
EVD08S/R	0.064"	16 ga.	0.064"	20 1/8	13 3/8	18 1/2 x 18 1/2	9 x 9	26 lbs
EVD10S/R	0.064"	16 ga.	0.064"	20 1/8	13 3/8	18 1/2 x 18 1/2	11 1/2 x 11 1/2	29 lbs
EVD11V/S/R	0.064"	16 ga.	0.064"	20 1/8	13 3/8	18 1/2 x 18 1/2	11 1/2 x 11 1/2	38 lbs
EVD11Q	0.064"	16 ga.	0.064"	20 1/8	13 3/8	18 1/2 x 18 1/2	11 1/2 x 11 1/2	40 lbs

All dimensions are in inches. \*Outside dimension of curb should be 1 1/2" less than "E" dimension.



Model	Nominal			Tip Speed FPM	0.000" SP		0.125" SP		0.250" SP		0.375" SP		0.500" SP		0.625" SP		0.750" SP		0.875" SP		1.000" SP		1.250" SP	
	HP	Max Watts	RPM		CFM	Sones																		
EVD06R	1/100	52	1550	2841	146	4.3	100	3.6	69	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	
EVD08S	1/50	44	1300	3361	237	1.5	161	2.2	114	3	69	3.8	-	-	-	-	-	-	-	-	-	-	-	
EVD08R	1/30	55	1550	4007	285	2.4	199	2.8	141	3.5	94	4.1	58	4.9	-	-	-	-	-	-	-	-	-	
EVD10S	1/25	82	1300	3361	385	3.9	316	3.5	257	4.8	207	5.1	168	5.2	129	5.6	82	6.1	-	-	-	-	-	
EVD10R	1/12 (1)	121	1550	4007	559	6.1	501	5.9	446	6.1	394	6.5	338	6.8	267	7	187	7.2	100	7.4	-	-	-	
EVD11V	1/25	111	1050	3058	388	1.8	223	2.2	148	3.1	112	3.7	80	4.5	49	5.3	-	-	-	-	-	-	-	
EVD11S	1/11	142	1300	3786	503	3.4	397	3.6	320	4.3	262	5	201	5.5	149	6	104	6.5	-	-	-	-	-	
EVD11R	1/6 (2)	201	1550	4514	736	6.7	659	6.4	577	6.6	502	6.9	432	7.6	356	7.9	274	7.9	188	7.9	100	7.9	-	
EVD11Q	1/5 (3)	268	1725	5024	997	10.2	921	9.7	850	9.5	768	9.5	685	9.4	598	9.2	511	9	409	8.7	294	8.9	100	8.9

(1) TE motor is 1/6 Hp.

(2) TE motor is 1/7 Hp.

(3) EXP motor is 1/4 Hp.

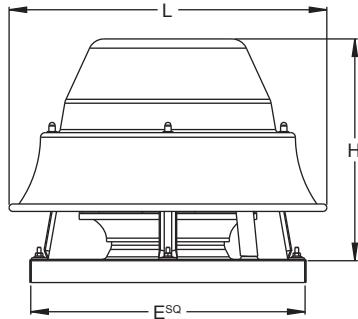
Performance shown is for installation Type A: Free Inlet, Free Outlet. Speed (RPM) shown is nominal. Performance is based on actual speed of test. The sound ratings shown are for loudness values in fan sones at 5'0" (1.5m) in a hemispherical free field per AMCA Standard 301. Values shown are for installation Type A: free inlet hemispherical sone levels. Performance ratings do not include the effects of appurtenances in the air stream.

EVD fans are only one component of a total system. As such, fan performance is directly affected by the system. It is critical that system designers determine the actual system loss to ensure that the actual flow is specified in the system design.

## EVD13 | DIRECT DRIVE

Model	Material Gages			Dimensions					Est. Ship Wt.
	Alum. Base	Galv. Base	Hood/ Apron	L (Dia.)	H	E*	Ro		
EVD13V/S/R	0.064"	16 ga.	0.064"	21 7/16	14 3/4	18 1/2 x 18 1/2	11 1/2 x 11 1/2	36 lbs	
EVD13Q	0.064"	16 ga.	0.064"	21 7/16	14 3/4	18 1/2 x 18 1/2	11 1/2 x 11 1/2	43 lbs	

All dimensions are in inches. \*Outside dimension of curb should be 1 1/2" less than "E" dimension.



Model	Nominal			Tip Speed FPM	0.000" SP		0.125" SP		0.250" SP		0.375" SP		0.500" SP		0.625" SP		0.750" SP		0.875" SP		1.000" SP		1.250" SP	
	HP	Max Watts	RPM		CFM	Sones																		
EVD13V	1/20	92	1050	3221	661	4.4	479	3.1	341	2.8	262	3.6	207	4.3	161	5.1	115	5.9	79	6.6	44	7.4	-	-
EVD13S	1/12	120	1300	3988	869	8	749	6.4	632	5.3	510	5.4	418	6	349	6.4	290	6.7	226	7	158	7.4	-	-
EVD13R	1/6	201	1550	4755	1054	10.5	988	9.9	917	9.2	839	8.9	736	8.5	651	8.2	579	7.9	510	7.9	428	8	191	8.5
EVD13Q	1/4	314	1725	5292	1280	16	1226	15.3	1170	14.6	1112	14	1053	13.4	995	13	936	12.5	868	12	796	11.5	630	11

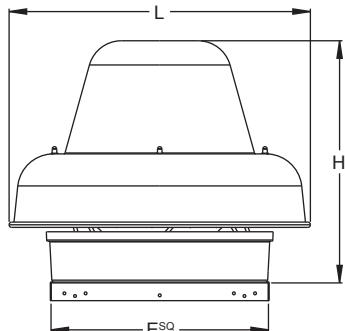
Performance shown is for installation Type A: Free Inlet, Free Outlet. Speed (RPM) shown is nominal. Performance is based on actual speed of test. The sound ratings shown are for loudness values in fan sones at 5'0" (1.5m) in a hemispherical free field per AMCA Standard 301. Values shown are for installation Type A: free inlet hemispherical sone levels. Performance ratings do not include the effects of appurtenances in the air stream.

EVD fans are only one component of a total system. As such, fan performance is directly affected by the system. It is critical that system designers determine the actual system loss to ensure that the actual flow is specified in the system design.

## EVD16 & EVD18 | DIRECT DRIVE

Model	Material Gages			Dimensions					Est. Ship Wt.
	Alum. Base	Galv. Base	Hood/ Apron	L (Dia.)	H	E*	Ro		
EVD16V/S/R, Q1 & Q2	0.064"	16 ga.	0.064"	28 1/2	22 1/2	20 1/2 x 20 1/2	16 x 16	56 lbs	
EVD18V	0.080"	14 ga.	0.064"	39	31	28 1/2	20	78 lbs	

All dimensions are in inches. \*Outside dimension of curb should be 1 1/2" less than "E" dimension.



Model	Nominal			Tip Speed FPM	0.000" SP		0.125" SP		0.250" SP		0.375" SP		0.500" SP		0.625" SP		0.750" SP		0.875" SP		1.000" SP		1.250" SP	
	HP	Max Watts	RPM		CFM	Sones																		
EVD16V	1/6	453	1050	3788	1738	9.9	1489	8	1256	6.6	1032	6.1	884	6.6	772	7.1	682	7.9	598	9.9	529	10.1	392	10.2
EVD16S	1/3	510	1300	4690	2021	12	1822	10.6	1637	9.5	1428	8.7	1256	8.4	1094	8.5	943	9.3	850	10.2	775	11	606	12.3
EVD16R	1/3 (1)	574	1550	5592	2346	13.8	2176	12.8	2014	12	1853	11.3	1685	10.7	1532	10.4	1384	10.1	1247	10	1115	10.4	881	12.4
EVD16Q1	1/2	688	1650	5953	2701	16.9	2576	16.4	2465	15.9	2352	15.5	2228	15	2096	14.4	1966	14	1839	13.6	1700	13.5	1401	13.5
EVD16Q2	3/4	866	1725	6223	3016	17.7	2921	17.1	2829	16.7	2747	16.3	2665	15.9	2575	15.5	2484	15	2371	14.6	2256	14.2	2005	13.3
EVD18V	3/4	964	1075	6029	4561	21	4395	19.8	4230	19.1	4053	18.5	3865	17.9	3671	16.9	3454	16.4	3237	16.4	2995	16.4	2405	16.4

(1) TE motor is 1/2 Hp.

Performance shown is for installation Type A: Free Inlet, Free Outlet. Speed (RPM) shown is nominal. Performance is based on actual speed of test. The sound ratings shown are for loudness values in fan sones at 5'0" (1.5m) in a hemispherical free field per AMCA Standard 301. Values shown are for installation Type A: free inlet hemispherical sone levels. Performance ratings do not include the effects of appurtenances in the air stream.

EVD fans are only one component of a total system. As such, fan performance is directly affected by the system. It is critical that system designers determine the actual system loss to ensure that the actual flow is specified in the system design.

## DIRECT DRIVE PERFORMANCE DATA

### EVD Fan Curves

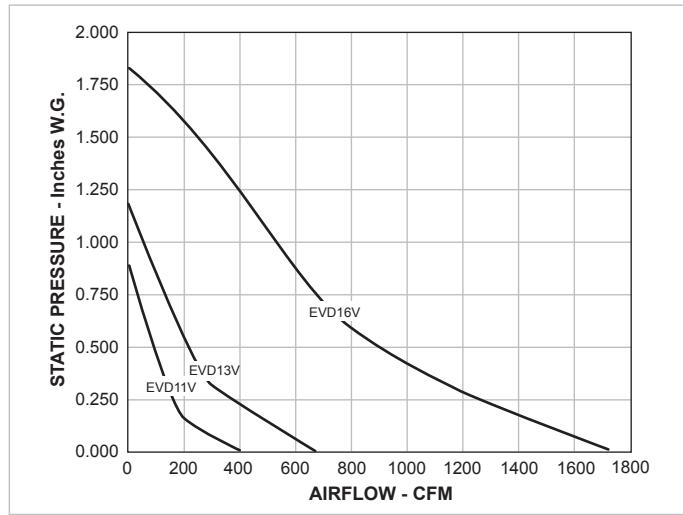
The fan curves illustrated here show the range of capacities available for direct drive units. Each graph shows the performance of several models at one particular nominal speed. Fan curves provide a quick method for selecting a fan unit based on design point requirements.

The direct drive performance chart on the previous page provides the tabular data (CFM and static pressure) used to plot the fan curves. In addition, the horsepower, tip speed and sones are tabulated. Since sound is normally an important factor in the selection of a fan, an engineer will usually want to select the "slowest" unit which meets CFM and SP requirements.

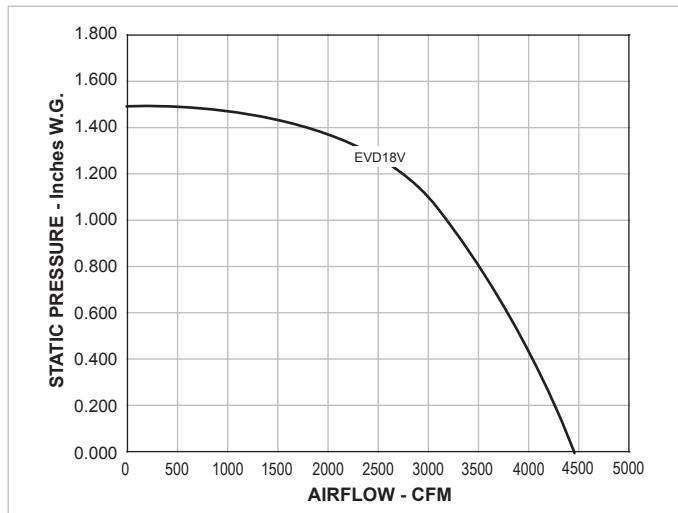
Please refer to the Motor Selection section to make sure the motor you select meets your electrical requirements.

*EVD fans are only one component of a total system. As such, fan performance is directly affected by the system. It is critical that system designers determine the actual system loss to ensure that the actual flow is specified in the system design.*

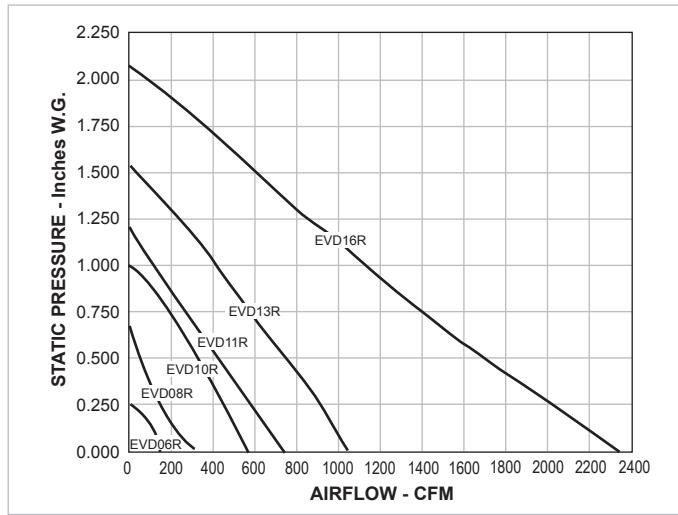
### Nominal 1075 RPM



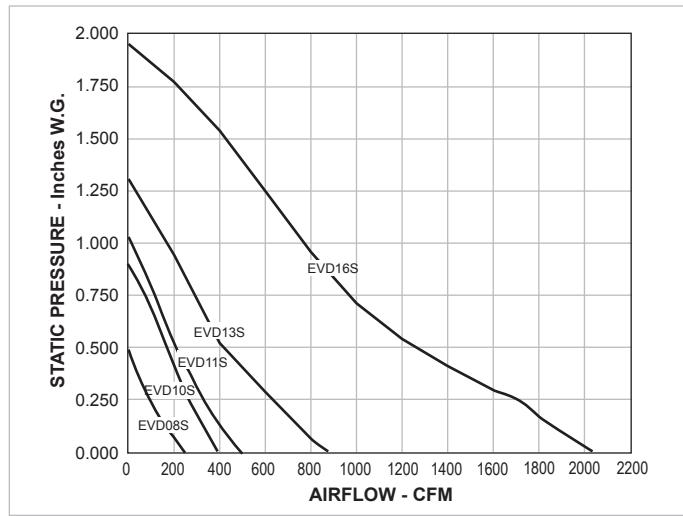
### Nominal 1075 RPM



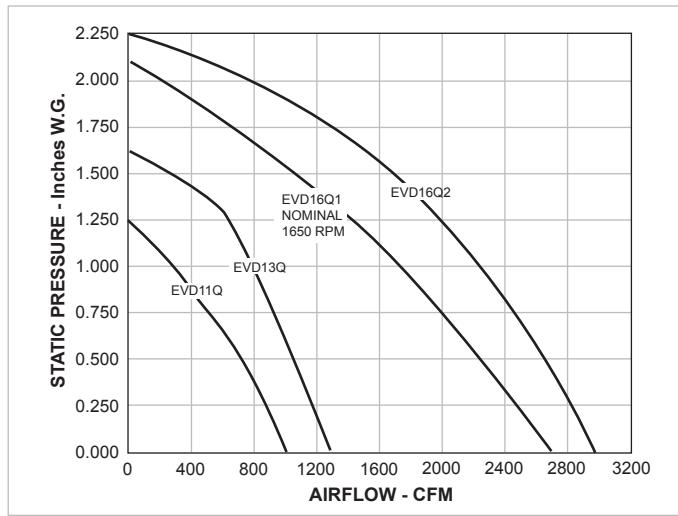
### Nominal 1050 RPM



### Nominal 1300 RPM



### Nominal 1725 RPM



## BELT DRIVE PERFORMANCE DATA

### Performance Data

The belt drive models shown on the following pages have sizes and capacities ranging from below 300 CFM to above 39,000 CFM, with static pressures from 0" to above 1 ½". All models are available with a wide range of horsepower sizes and RPM's. Two-speed motors are commonly used to enhance this flexibility.

The data provided for each belt drive model includes:

- Elevation Drawing Showing Overall Dimensions
- Fan Curve Graph
- Performance Chart

Each curve graphically displays the range of capacities available for each model, in most cases beyond the specifics shown in the tabular data. The maximum performance afforded by each horsepower is indicated by dashed lines and the RPM is indicated by solid lines.

Some models have graphs that show both shaded and unshaded areas. Selection should be made from the unshaded area only. Shaded areas reflect unstable performance ("surge"), a characteristic typical of backward inclined wheels, and should be avoided. These unstable regions are not shown in the tabular data.

The highest RPM shown for a specific horsepower in the tabular data is the maximum speed that for any point along the performance curve, the BHP will not exceed the available horsepower.

It is important to note that while it is common industry-wide practice to exceed a "nominal" horsepower by using a motor's service factor, YORK® by Johnson Controls uses a conservative portion of the service factor, allowing half to remain a true "safety" factor.

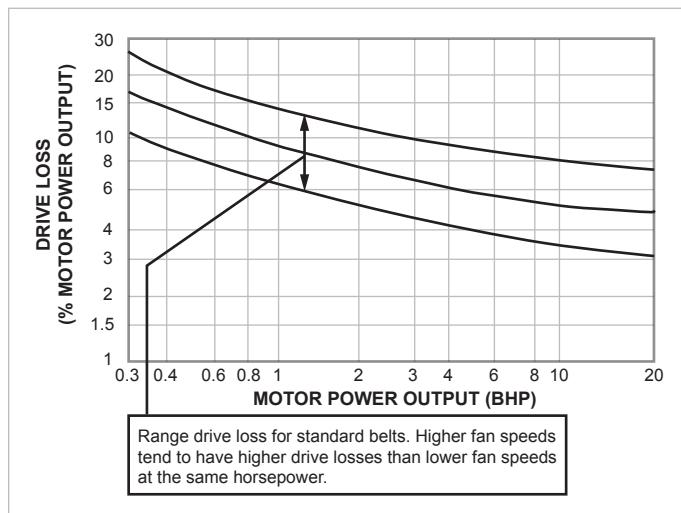
Use the Motor Availability chart (see Motor Selection) to select motor enclosures and voltages which can be installed in the fans.

*Note: EVD fans are only one component of a total system. As such, performance is directly affected by the system. It is critical that system designers determine actual system losses to ensure that the actual flow is specified in the system range.*

### Belt Drive Losses

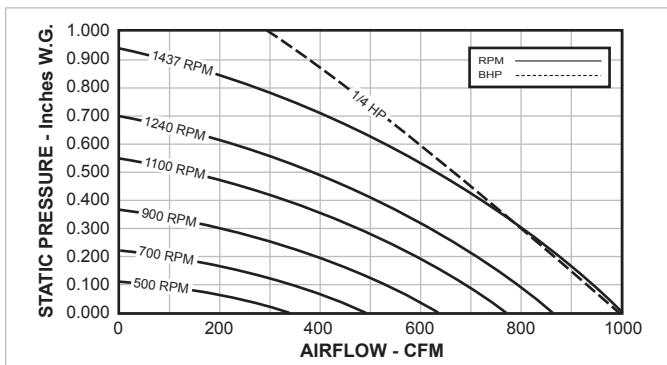
The AMCA Review Committee has developed the chart shown below for the purpose of estimating belt drive losses. To calculate total BHP (including drive losses): Find the BHP of your operating point on the x-axis on the graph below. Follow the vertical line to the curves indicating the range of drive losses. Look at the y-axis on the left and find the drive loss percentage. Calculate the total BHP by adding the drive loss to the operating point BHP. For BHP's below 0.3, use 30%.

### Drive Loss Reference Chart

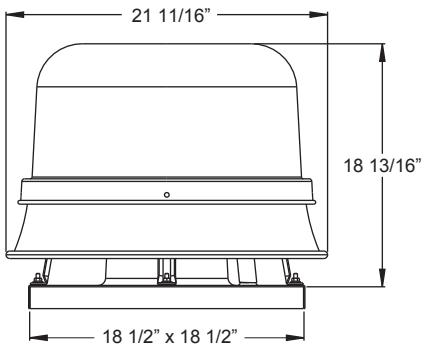


*For totally enclosed, explosion proof, multi-speed and all 1.0 Service Factor motors, fan BHP plus drive losses should not exceed motor rated HP.*

*Graph reprinted from AMCA publication 203, with the express written permission from the Air Movement and Control Association, Inc., 30 West University Drive, Arlington Heights, IL 60004-1983.*

**EVD06B | BELT DRIVE**

Galv. Steel Base = 16 Gage
Aluminum Base = 0.064"
Discharge Apron = 0.05"
Hood = 0.064"
Roof Opening = 11 1/2" SQ.
Damper Size = 11 1/4" SQ.
Max. Motor Frame Size = 42
Peak BHP = (RPM/2232) <sup>3</sup>
Max. RPM = 1437 (1/4 HP)
Est. Ship Weight = 35 lbs.



HP	RPM	Tip Speed FPM	0.000" SP		0.125" SP		0.250" SP		0.375" SP		0.500" SP		0.625" SP	
			Sones	BHP	Sones	BHP	Sones	BHP	Sones	BHP	Sones	BHP	Sones	BHP
1/4	375	1092	264		-		-		-		-		-	
			1.6 0.01		-		-		-		-		-	
	430	1252	302		-		-		-		-		-	
			1.8 0.01		-		-		-		-		-	
	475	1383	334		-		-		-		-		-	
			2.1 0.01		-		-		-		-		-	
	520	1515	366		-		-		-		-		-	
			2.2 0.01		-		-		-		-		-	
	565	1646	397		-		-		-		-		-	
			2.4 0.02		-		-		-		-		-	
	610	1777	429	179		-		-	-		-		-	
			2.9 0.02	2.5 0.02		-		-	-		-		-	
	655	1908	461	244		-		-	-		-		-	
			3.1 0.02	2.6 0.02		-		-	-		-		-	
	700	2039	492	298		-		-	-		-		-	
			3.4 0.03	2.9 0.03		-		-	-		-		-	
	745	2170	524	347		-		-	-		-		-	
			3.7 0.04	3.2 0.03		-		-	-		-		-	
	790	2301	556	394		114		-	-		-		-	
			4.0 0.04	3.5 0.04	3.1 0.04		-	-	-		-		-	
	835	2432	587	438	209		-	-	-		-		-	
			4.4 0.05	3.8 0.05	3.5 0.04		-	-	-		-		-	
	880	2563	619	480	279		-	-	-		-		-	
			4.8 0.06	4.3 0.06	3.7 0.05		-	-	-		-		-	
	925	2694	651	519	344		-	-	-		-		-	
			5.2 0.07	4.7 0.07	4.1 0.06		-	-	-		-		-	
	970	2825	683	558	398	146		-	-		-		-	
			5.9 0.08	5.3 0.08	4.6 0.07	4.4 0.05		-	-		-		-	
	1015	2956	714	597	450	243		-	-		-		-	
			6.4 0.09	5.8 0.09	5.2 0.08	4.8 0.07		-	-		-		-	
	1060	3087	746	635	498	315		-	-		-		-	
			6.5 0.11	6.0 0.10	5.3 0.10	4.9 0.08		-	-		-		-	
	1105	3218	778	674	544	382		131			-		-	
			6.8 0.12	6.3 0.12	5.7 0.11	5.1 0.10	4.9 0.07				-		-	
	1150	3349	809	712	590	442		241			-		-	
			7.2 0.13	6.7 0.13	6.1 0.13	5.5 0.12	5.1 0.10				-		-	
	1195	3480	841	749	634	496		318			-		-	
			7.7 0.15	7.2 0.15	6.5 0.14	5.9 0.13	5.4 0.12				-		-	
	1240	3612	873	783	675	547		389			158		-	
			8.2 0.17	7.6 0.17	6.9 0.16	6.4 0.15	5.8 0.14	5.3 0.11			-		-	
	1280	3728	901	814	710	590	447			256			-	
			8.4 0.19	7.9 0.18	7.3 0.18	6.7 0.17	6.3 0.16	5.9 0.13			-		-	
	1320	3845	929	845	745	633		501			330		-	
			8.8 0.20	8.2 0.20	7.6 0.20	7.1 0.19	6.7 0.18	6.4 0.15			-		-	
	1350	3932	950	868	771	664		537			378		-	
			9.1 0.22	8.5 0.22	8.0 0.21	7.4 0.20	7.0 0.19	6.8 0.17			-		-	
	1390	4048	978	898	805	704		585			440		-	
			9.5 0.24	9.1 0.24	8.4 0.23	7.9 0.22	7.5 0.21	7.3 0.19			-		-	
	1420	4136	999	921	830	734		619			484		-	
			9.9 0.25	9.4 0.25	8.8 0.25	8.3 0.24	7.8 0.23	7.6 0.21			-		-	
	1437	4185	1011	933	845	750		638			509		-	
			10.1 0.26	9.5 0.26	9.1 0.25	8.5 0.25	8.0 0.24	7.9 0.22			-		-	

Performance shown is for installation type A: Free Inlet, Free Outlet. Power rating (BHP) does not include transmission losses. For further information on estimating belt drive losses and motor service factors see page 13. The sound ratings shown are for loudness values in fan sones at 5'0" (1.5m) in a hemispherical free field per AMCA Standard 301. Values shown are for installation Type A: free inlet hemispherical sone levels. Performance ratings do not include the effects of appurtenances in the airstream.



























## ENGINEERING SPECIFICATIONS

<b>Model</b> EVD = Downblast Roof Exhauster	<b>Color</b> 0 = None 50 = Chrome Green 55 = Pale Green 56 = Dove Gray 61 = White 63 = Oxford Beige 65 = Dover White 66 = Desert Tan 70 = Black 73 = Smoke Gray 77 = Brick Red 79 = Peppercorn 81 = Pale Brown 83 = Chocolate Brown 85 = Timeless Bronze 94 = Charcoal X = Special	<b>Curb Paint/Coating</b> 0 = None B = Air Dried Epoxy Q = Enamel
<b>Unit Size</b> 06, 08, 10, 11, 12, 14, 16, 18, 24, 27, 30, 36, 420, 48, 542		<b>Hinged Sub-base</b> 0 = None H = Hinged Sub-base
<b>Drive Type</b> D = Direct Drive B = Belt Drive		<b>Mounting Pedestal</b> 0 = None P = Mounting Pedestal
<b>Motor Tap</b> Q = 1725 RPM R = 1550 RPM S = 1300 RPM V = 1050 RPM Q1 = 1650 RPM Q2 = 1725 RPM		<b>Aluminum Base</b> 0 = None A = Aluminum Base
<b>ECM</b> 0 = None G = ECM	<b>AMCA Spark Rating</b> 0 = None C = Standard B = Optional	<b>Thermal Overload Protection</b> 0 = None P = Thermal Overload Protection
<b>Motor Speed</b> 1 = Single Speed 2 = 2S2W Single & Three Phase 3 = 2S1W Three Phase	<b>Damper</b> 0 = None BDD = Gravity Backdraft Damper MD1 = Gravity Backdraft Damper 115V MD2 = Gravity Backdraft Damper 230V MD4 = Gravity Backdraft Damper 460V ED1 = Explosion Proof Motor Operated Damper 115V	<b>Disconnect Switch</b> 0 = None 1 = NEMA 1 Disconnect Switch 3R = NEMA 3R Disconnect Switch 4 = NEMA 4 Disconnect Switch 7 = NEMA 7 Disconnect Switch 9 = NEMA 9 Disconnect Switch
<b>Horse Power</b> See selection software.	<b>Screen</b> 0 = None B = Bird Screen (Standard) S = Insect/Bird Screen	<b>Internal Wiring</b> 0 = None 1 = NEMA 1 Internal Wiring 3R = NEMA 3R Internal Wiring
<b>Enclosure</b> O = Open Drip Proof T = Totally Enclosed E = Explosion Proof X = Special	<b>Roof Curb</b> See selection software.	<b>Transformer</b> 0 = None T = Transformer
<b>Voltage</b> See selection software.	<b>Slope</b> 0 = None S = Single D = Double	<b>Speed Controller</b> 0 = None L = Loose M = Mounted
<b>Phase</b> 1 = Single 3 = Three	<b>Metal Liner</b> 0 = None L = Metal Liner	<b>Firestat Switch</b> 0 = None F = Firestat Switch
<b>Cycle</b> 5 = 50 Hz 6 = 60 Hz	<b>Damper Holding Plate</b> 0 = None P = Damper Holding Plate	<b>High Wind Construction</b> 0 = None M = Miami Dade Approved
<b>Efficiency</b> S = Standard P = Premium	<b>Neoprene Gasket</b> 0 = None G = Gasket	
<b>Paint / Coating</b> 0 = None F = Epoxy Powder Coat* G = Epoxy Powder Coat with UV* H = Hi-Temp Powder Coat* J = Non-stick Powder Coat* K = Phenolic Powder Coat* L = Phenolic Powder Coat with UV* N = Polyester Powder Coat X = Special * Not available with choice of color.	<b>Wooden Nailer</b> 0 = None W = Wooden Nailer	

## ENGINEERING SPECIFICATIONS

### EVD-Series - Belt Drive Units

Belt driven centrifugal roof exhaust fans shall be model EVD, EVDK, EVDJ, EVDM, manufactured by YORK® by Johnson Controls.

The housing shall be weatherproof, utilize heavy gauge spun aluminum construction with a large rolled bead for strength, with galvanized (aluminum optional) base, and with rigid galvanized steel internal support structures. Housing shall not provide any of the internal structural support. Units shall be equipped with an oversized electrical conduit chase through the curb cap and into the motor compartment for ease of wiring (except Explosion Proof). Units shall be pre-wired to a junction box mounted in the motor compartment and equipped with an electrical disconnect device (except Explosion Proof).

Statically and dynamically balanced backward inclined, centrifugal wheels shall be aluminum, spark-resistant, non-overloading, and matched to deeply spun venturis. Motors shall be continuous duty, ball bearing design, permanently lubricated, mounted out of the main airstream, and furnished at the specified voltage, phase, and enclosure.

Shafts shall be turned, ground, polished, and rust protected. Heavy duty ball bearings are rated for a minimum L50 life exceeding 200,000 hours. Pulleys shall be adjustable, cast iron, machined, keyed, securely attached, and sized for 150% of the horsepower at its rated maximum speed.

Each fan shall bear the AMCA Licensed Ratings Seal for Air and Sound Performance (EVD) or for Air performance (EVDK, EVDJ, EVDM) and shall be cULus listed.

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### EVD-Series - Direct Drive Units

Direct drive centrifugal roof exhaust fans shall be model EVD, manufactured by YORK® by Johnson Controls.

The housing shall be weatherproof, utilize heavy-gauge spun aluminum construction with a large rolled bead for strength, with galvanized (aluminum optional) base, and with rigid galvanized steel internal support structures. Housing shall not provide any of the internal structural support. Units shall be equipped with an oversized electrical conduit chase through the curb cap and into the motor compartment for ease of wiring (except Explosion Proof). Units shall be pre-wired to a junction box mounted in the motor compartment and equipped with an electrical disconnect device (except Explosion Proof).

Statically and dynamically balanced backward inclined, centrifugal wheels shall be aluminum, spark-resistant, non-overloading, and matched to deeply spun venturis. Motors shall be continuous duty, permanently lubricated, multi-speed (for applicable models), have thermal overload protection, mounted out of the main airstream, be easily accessible for service, and furnished at the specified voltage, phase.

Each fan shall bear the AMCA Licensed Ratings Seal for Air and Sound Performance and shall be cULus listed.

## **NOTES**



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At Johnson Controls, we truly understand HVAC systems. In fact, we produce some of the most robust HVAC equipment, parts and controls on the market today. But we don't just sell products. We also offer the expertise, services and strategic insight to make them work within your current system, optimizing your building's performance and lowering your overall costs. If you're interested in revolutionizing your HVAC system, contact an expert today. Otherwise, browse our full-suite of HVAC products.

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